



Surface Mount Multilayer Ceramic Capacitors

ESD Protected X7R & COG 25 – 200 VDC

Electronic Components
KEMET
CHARGED®

Why Choose KEMET

KEMET Electronics Corporation is a leading global supplier of electronic components. We offer our customers the broadest selection of capacitor technologies in the industry, along with an expanding range of electromechanical devices, electromagnetic compatibility solutions and supercapacitors. Our vision is to be the preferred supplier of electronic component solutions for customers demanding the highest standards of quality, delivery and service.

Features & Benefits

- AEC-Q200 qualification
- ESD qualified per HBM AEC-Q200-002
- Available in EIA case size 0603 (1608)
- DC voltage ratings of 25 V, 50 V, 63 V, 100 V & 200 V
- Capacitance range from 1 nF to 220 nF
- -55°C to +125°C operating temperature range
- Lead (Pb)-Free, RoHS & REACH compliant
- Available capacitance tolerances of $\pm 1\%$, $\pm 2\%$, $\pm 5\%$, $\pm 10\%$ & $\pm 20\%$
- 100% pure matte tin-plated termination finish allowing for excellent solderability
- Non-polar devices, minimizing installation concerns
- Flexible termination option available
- EIA 0805 & 1206 case sizes under development

With COG Dielectric

- No piezoelectric noise
- Extremely low ESR & ESL
- High thermal stability
- High ripple current capability
- Preferred capacitance solution at line frequencies & into the MHz range
- No capacitance changes with respect to applied DC voltage
- Negligible capacitance change with respect to temperature from -55°C to +125°C
- No capacitance decay with time

Product Checklist

- What is the end application?
- Is ESD capability a concern?
- Do you require a design to a given ESD criteria?

For more information, samples and engineering kits, please visit us at www.kemet.com or call 1.877.myKEMET.

Applications

KEMET's ESD Rated Commercial and Automotive Grade surface mount capacitors in X7R and COG dielectrics are well-suited for a variety of applications where Electro Static Discharge (ESD) events during assembly or operation could damage the capacitor or the circuit. These capacitors provide the ability to design to a given ESD criteria as per the Human Body Model (HBM) AEC-Q200-002 criteria. Typical applications include electrostatic discharge, integrated circuit (IC) protection, RF filtering, input and output automotive applications such as controllers, navigation systems, airbags and keyless entry systems.



Electrical/Physical Characteristics

	COG	X7R
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C
Capacitance Change with Reference to +25°C and 0 VDC Applied (TCC)	± 30 ppm/°C	$\pm 15\%$
Aging Rate (Maximum % Capacitance Loss/Decade Hour)	0%	3.0%
Dielectric Withstanding Voltage (DWV)	250% of rated voltage (5 $\pm$ 1 seconds and charge/discharge not exceeding 50 mA)	250% of rated voltage (5 $\pm$ 1 seconds and charge/discharge not exceeding 50 mA)
Dissipation Factor (DF) Maximum Limit at 25°C	0.1%	5% (6.3 V & 10 V), 3.5% (16 V & 25 V) and 2.5% (50 V to 250 V)
Insulation Resistance (IR) Minimum Limit at 25°C	100 G Ω (Rated voltage applied for 120 $\pm$ 5 seconds at 25°C)	See Insulation Resistance Limit Table (Rated voltage applied for 120 $\pm$ 5 secs at 25°C)

Ordering Information

C	0603	C	104	J	3	R	E	C	TU
Ceramic	Style/Size (L" x W")	Specification/ Series	Capacitance Code (pF)	Capacitance Tolerance	Voltage (VDC)	Dielectric	Failure Rate	Termination Finish	Packaging/ Grade (C-Spec)
	0603	C = Standard X = Flexible Termination	2 Sig. Digits + Number of Zeros.	F = $\pm 1\%$ G = $\pm 2\%$ J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$	3 = 25 5 = 50 M = 63 1 = 100 2 = 200	R = X7R G = COG	E = ESD	C = 100% Matte Sn	See "Packaging C-Spec Ordering Options Table"



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ESD Withstanding Capability

X7R C0603C ESD Level per AEC-Q200						
Capacitance	Tolerance	Rated Voltage (VDC)				
		25	50	63	100	200
1.0 nF	J = ±5% K = ±10% M = ±20%	25 KV	25 KV	25 KV	25 KV	25 KV
1.5 nF		12 KV	12 KV	12 KV	12 KV	12 KV
2.2 nF		25 KV	25 KV	25 KV	25 KV	25 KV
3.3 nF		12 KV	12 KV	12 KV	12 KV	12 KV
4.7 nF		16 KV	16 KV	16 KV	16 KV	16 KV
6.8 nF		25 KV	25 KV	25 KV	25 KV	25 KV
10 nF		25 KV	25 KV	25 KV	25 KV	25 KV
15 nF		16 KV	16 KV	16 KV	16 KV	
22 nF		16 KV	16 KV	16 KV	16 KV	
33 nF		25 KV	25 KV	25 KV	25 KV	
47 nF		25 KV	25 KV	25 KV	25 KV	
68 nF		25 KV	25 KV			
100 nF		25 KV	25 KV			
150 nF		25 KV	25 KV			
220 nF		25 KV				

C0G C0603C ESD Level per AEC-Q200						
Capacitance	Tolerance	Rated Voltage (VDC)				
		25	50	63	100	200
1.0 nF	F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	6 KV	6 KV	6 KV	6 KV	6 KV
1.5 nF		8 KV	8 KV	8 KV	8 KV	8 KV
2.2 nF		12 KV	12 KV	12 KV	12 KV	12 KV
3.3 nF		16 KV	16 KV	16 KV	16 KV	
4.7 nF		16 KV	16 KV	16 KV	16 KV	
6.8 nF		25 KV	25 KV			
10 nF		25 KV				
15 nF		25 KV				